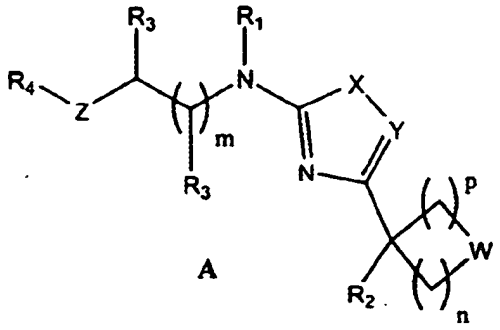
We claim:

1. A compound represented by A:



A

wherein

m is 0, 1, 2, or 3;

n is 0, 1, 2, or 3;

p is 1, 2, or 3;

W represents CH_2, O, or NR;

X represents S or O;

Y represents CR', or N;

Z represents $N(R_5)$ or O;

R represents H or alkyl;

R' represents H, alkyl, or halogen;

R_1 represents H or alkyl;

R_2 represents aryl or heteroaryl;

R_3 represents independently for each occurrence H, alkyl, alkoxyl, or alkylamino;

R_4 represents H or alkyl;

R_5 represents H, alkyl, aryl, or aralkyl;

R_1 and R_3 may be connected through a covalent bond;

R_1 and R_4 may be connected through a covalent bond;

R_3 and R_4 may be connected through a covalent bond;

R_3 and R_5 may be connected through a covalent bond;

R_4 and R_5 may be connected through a covalent bond; or $-N(R_4)(R_5)$ represents 4-morpholinyl, or 4-alkyl-1,4-piperazin-1-yl; and

the stereochemical configuration at a stereocenter in a compound represented by **A** is *R*, *S*, or a mixture thereof.

2. The compound of claim 1, wherein X represents S.

3. The compound of claim 1, wherein Y represents CR'.

4. The compound of claim 1, wherein Z represents $N(R_5)$.

5. The compound of claim 1, wherein W represents CH_2 or O.

6. The compound of claim 1, wherein n is 1 or 2; and p is 2.

7. The compound of claim 1, wherein R' represents H.

8. The compound of claim 1, wherein R_2 represents phenyl, 3-chlorophenyl, 4-chlorophenyl, 2-fluorophenyl, or 5-chlorobenzo[b]thiophen-3-yl.

9. The compound of claim 1, wherein R_5 represents H or alkyl.

10. The compound of claim 1, wherein X represents S; and Y represents CR'.

11. The compound of claim 1, wherein X represents S; Y represents CR'; and Z represents $N(R_5)$.

12. The compound of claim 1, wherein X represents S; Y represents CR'; Z represents $N(R_5)$; and W represents CH_2 or O.

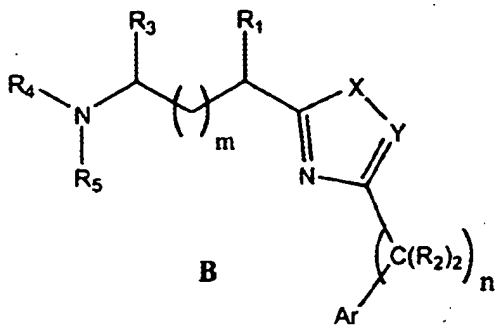
13. The compound of claim 1, wherein X represents S; Y represents CR'; Z represents $N(R_5)$; W represents CH_2 or O; n is 1 or 2; and p is 2.

14. The compound of claim 1, wherein X represents S; Y represents CR'; Z represents $N(R_5)$; W represents CH_2 or O; n is 1 or 2; p is 2; and R' represents H.

15. The compound of claim 1, wherein X represents S; Y represents CR'; Z represents $N(R_5)$; W represents CH_2 or O; n is 1 or 2; p is 2; R' represents H; and R_2 represents phenyl, 3-chlorophenyl, 4-chlorophenyl, 2-fluorophenyl, or 5-chlorobenzo[b]thiophen-3-yl.

16. The compound of claim 1, wherein X represents S; Y represents CR'; Z represents $N(R_5)$; W represents CH_2 or O; n is 1 or 2; p is 2; R' represents H; R_2 represents phenyl, 3-chlorophenyl, 4-chlorophenyl, 2-fluorophenyl, or 5-chlorobenzo[b]thiophen-3-yl; and R_5 represents H or alkyl.

17. A compound represented by **B**:



B

wherein

m is 0, 1, 2, or 3;

n is 0, 1, 2, or 3;

X represents S or O;

Y represents CR', or N;

Ar represents aryl or heteroaryl;

R' represents H, alkyl, or halogen;

R_1 represents H or alkyl;

R_2 represents independently for each occurrence H, alkyl, aryl, or heteroaryl;

R_3 represents H or alkyl;

R_4 represents H or alkyl;

R_5 represents H or alkyl;

R_1 and R_4 may be connected through a covalent bond;

R_3 and R_4 may be connected through a covalent bond;

R_4 and R_5 may be connected through a covalent bond; or $-N(R_4)(R_5)$ represents 4-morpholinyl; and

the stereochemical configuration at a stereocenter in a compound represented by **B** is *R*, *S*, or a mixture thereof.

18. The compound of claim 17, wherein X represents S.

19. The compound of claim 17, wherein Y represents CR'.

20. The compound of claim 17, wherein R' represents H.

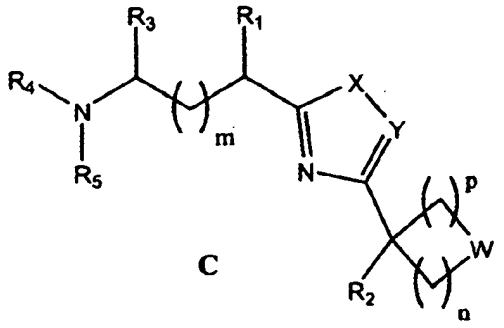
21. The compound of claim 17, wherein Ar represents phenyl, 3-chlorophenyl, 4-chlorophenyl, 2-fluorophenyl, or 5-chlorobenzo[b]thiophen-3-yl.

22. The compound of claim 17, wherein X represents S; and Y represents CR'.

23. The compound of claim 17, wherein X represents S; Y represents CR'; and R' represents H.

24. The compound of claim 17, wherein X represents S; Y represents CR'; R' represents H; and Ar represents phenyl, 3-chlorophenyl, 4-chlorophenyl, 2-fluorophenyl, or 5-chlorobenzo[b]thiophen-3-yl.

25. A compound represented by **C**:



C

wherein

m is 0, 1, 2, or 3;

n is 0, 1, 2, or 3;

p is 1, 2, or 3;

W represents CH_2, O, or NR;

X represents S or O;

Y represents CR', or N;

R represents H or alkyl;

R' represents H, alkyl, or halogen;

R_1 represents H or alkyl;

R_2 represents aryl, or heteroaryl;

R_3 represents H or alkyl;

R_4 represents H or alkyl;

R_5 represents H or alkyl;

R_1 and R_4 may be connected through a covalent bond;

R_3 and R_4 may be connected through a covalent bond;

R_4 and R_5 may be connected through a covalent bond; or $-N(R_4)(R_5)$ represents 4-morpholinyl; and

the stereochemical configuration at a stereocenter in a compound represented by **C** is *R*, *S*, or a mixture thereof.

26. The compound of claim 25, wherein X represents S.

27. The compound of claim 25, wherein Y represents CR'.

28. The compound of claim 25, wherein W represents CH_2 or O.

29. The compound of claim 25, wherein n is 1 or 2; and p is 2.

30. The compound of claim 25, wherein R' represents H.

31. The compound of claim 25, wherein R_2 represents phenyl, 3-chlorophenyl, 4-chlorophenyl, 2-fluorophenyl, or 5-chlorobenzo[b]thiophen-3-yl.

32. The compound of claim 25, wherein X represents S; and Y represents CR'.

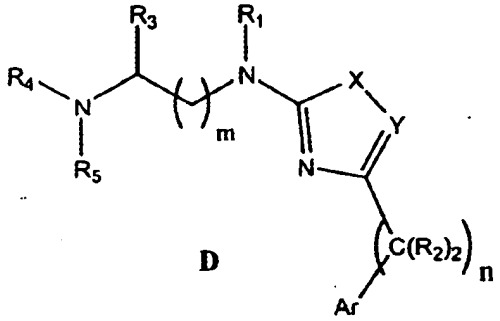
33. The compound of claim 25, wherein X represents S; Y represents CR'; and W represents CH_2 or O.

34. The compound of claim 25, wherein X represents S; Y represents CR'; W represents CH_2 or O; n is 1 or 2; and p is 2.

35. The compound of claim 25, wherein X represents S; Y represents CR'; W represents CH_2 or O; n is 1 or 2; p is 2; and R' represents H.

36. The compound of claim 25, wherein X represents S; Y represents CR'; W represents CH_2 or O; n is 1 or 2; p is 2; R' represents H; and R_2 represents phenyl, 3-chlorophenyl, 4-chlorophenyl, 2-fluorophenyl, or 5-chlorobenzo[b]thiophen-3-yl.

37. A compound represented by **D**:



D

wherein

m is 0, 1, 2, or 3;

n is 1, 2, or 3;

X represents S or O;

Y represents CR', or N;

Ar represents heteroaryl;

R' represents H, alkyl, or halogen;

R_1 represents H or alkyl;

R_2 represents independently for each occurrence H, alkyl, aryl, or heteroaryl;

R_3 represents H or alkyl;

R_4 represents H or alkyl;

R_5 represents H or alkyl;

R_1 and R_4 may be connected through a covalent bond;

R_3 and R_4 may be connected through a covalent bond;

R_4 and R_5 may be connected through a covalent bond; or $-N(R_4)(R_5)$ represents 4-morpholinyl; and

the stereochemical configuration at a stereocenter in a compound represented by **D** is *R*, *S*, or a mixture thereof.

38. The compound of claim 37, wherein X represents S.

39. The compound of claim 37, wherein Y represents CR'.

40. The compound of claim 37, wherein R' represents H.

41. The compound of claim 37, wherein Ar represents 5-chlorobenzo[b]thiophen-3-yl.

42. The compound of claim 37, wherein X represents S; and Y represents CR'.

43. The compound of claim 37, wherein X represents S; Y represents CR'; and R' represents H.

44. The compound of claim 37, wherein X represents S; Y represents CR'; R' represents H; and Ar represents 5-chlorobenzo[b]thiophen-3-yl.

45. The compound of claim 1, 17, 25, or 37, wherein said compound has an IC_{50} less than 1 μM in an assay based on a mammalian dopamine, muscarinic or serotonin receptor or transporter.

46. The compound of claim 1, 17, 25, or 37, wherein said compound has an IC_{50} less than 100 nM in an assay based on a mammalian dopamine, muscarinic or serotonin receptor or transporter.

47. The compound of claim 1, 17, 25, or 37, wherein said compound has an IC_{50} less than 10 nM in an assay based on a mammalian dopamine, muscarinic or serotonin receptor or transporter.

48. The compound of claim 1, 17, 25, or 37, wherein said compound has an EC_{50} less than 1 μM in an assay based on a mammalian dopamine, muscarinic or serotonin receptor or transporter.

49. The compound of claim 1, 17, 25, or 37, wherein said compound has an EC_{50} less than 100 nM in an assay based on a mammalian dopamine, muscarinic or serotonin receptor or transporter.

50. The compound of claim 1, 17, 25, or 37, wherein said compound has an EC_{50} less than 10 nM in an assay based on a mammalian dopamine, muscarinic or serotonin receptor or transporter.

51. The compound of claim 1, 17, 25, or 37, wherein said compound has an IC_{50} less than 1 μM in an assay based on a mammalian dopamine, muscarinic or serotonin receptor.

52. The compound of claim 1, 17, 25, or 37, wherein said compound has an IC_{50} less than 100 nM in an assay based on a mammalian dopamine, muscarinic or serotonin receptor.

53. The compound of claim 1, 17, 25, or 37, wherein said compound has an IC_{50} less than 10 nM in an assay based on a mammalian dopamine, muscarinic or serotonin receptor.

54. The compound of claim 1, 17, 25, or 37, wherein said compound has an EC_{50} less than 1 μM in an assay based on a mammalian dopamine, muscarinic or serotonin receptor.

55. The compound of claim 1, 17, 25, or 37, wherein said compound has an EC_{50} less than 100 nM in an assay based on a mammalian dopamine, muscarinic or serotonin receptor.

56. The compound of claim 1, 17, 25, or 37, wherein said compound has an EC_{50} less than 10 nM in an assay based on a mammalian dopamine, muscarinic or serotonin receptor.

57. The compound of claim 1, 17, 25, or 37, wherein said compound is a single stereoisomer.

58. A formulation, comprising a compound of claim 1, 17, 25, or 37; and a pharmaceutically acceptable excipient.

59. A method of modulating the activity of a dopamine, muscarinic or serotonin receptor or transporter in a mammal, comprising the step of:

administering to said mammal a therapeutically effective amount of a compound of claim 1, 17, 25, or 37.

60. The method of claim 59, wherein said mammal is a primate, equine, canine or feline.

61. The method of claim 59, wherein said mammal is a human.

62. The method of claim 59, wherein said compound is administered by inhalation.

63. The method of claim 59, wherein said compound is administered orally.

64. The method of claim 59, wherein said compound is administered intravenously.

65. The method of claim 59, wherein said compound is administered sublingually.

66. The method of claim 59, wherein said compound is administered ocularly.

67. The method of claim 59, wherein said compound is administered transdermally.

68. The method of claim 59, wherein said compound is administered rectally.

69. The method of claim 59, wherein said compound is administered vaginally.

70. The method of claim 59, wherein said compound is administered topically.

71. The method of claim 59, wherein said compound is administered intramuscularly.

72. The method of claim 59, wherein said compound is administered subcutaneously.

73. The method of claim 59, wherein said compound is administered buccally.

74. The method of claim 59, wherein said compound is administered nasally.

75. A method of modulating the activity of a dopamine, muscarinic or serotonin receptor in a mammal, comprising the step of:

administering to said mammal a therapeutically effective amount of a compound of claim 1, 17, 25, or 37.

76. The method of claim 75, wherein said mammal is a primate, equine, canine or feline.

77. The method of claim 75, wherein said mammal is a human.

78. The method of claim 75, wherein said compound is administered by inhalation.

79. The method of claim 75, wherein said compound is administered orally.

80. The method of claim 75, wherein said compound is administered intravenously.

81. The method of claim 75, wherein said compound is administered sublingually.

82. The method of claim 75, wherein said compound is administered ocularly.

83. The method of claim 75, wherein said compound is administered transdermally.

84. The method of claim 75, wherein said compound is administered rectally.

85. The method of claim 75, wherein said compound is administered vaginally.

86. The method of claim 75, wherein said compound is administered topically.

87. The method of claim 75, wherein said compound is administered intramuscularly.

88. The method of claim 75, wherein said compound is administered subcutaneously.

89. The method of claim 75, wherein said compound is administered buccally.

90. The method of claim 75, wherein said compound is administered nasally.

91. A method of treating a mammal suffering from addiction, anxiety, depression, sexual dysfunction, hypertension, migraine, Alzheimer's disease, obesity, emesis, psychosis, analgesia, schizophrenia, Parkinson's disease, restless leg syndrome, sleeping disorders, attention deficit hyperactivity disorder, irritable bowel syndrome, premature ejaculation, menstrual dysphoria syndrome, urinary incontinence, inflammatory pain, neuropathic pain, Lesche-Nyhane disease, Wilson's disease, Tourette's syndrome, psychiatric disorders, stroke, senile dementia, peptic ulcers, pulmonary obstruction disorders, or asthma, comprising the step of:

administering to said mammal a therapeutically effective amount of a compound of claim 1, 17, 25, or 37.

92. The method of claim 91, wherein said mammal is a primate, equine, canine or feline.

93. The method of claim 91, wherein said mammal is a human.

94. The method of claim 91, wherein said compound is administered by inhalation.

95. The method of claim 91, wherein said compound is administered orally.

96. The method of claim 91, wherein said compound is administered intravenously.

97. The method of claim 91, wherein said compound is administered sublingually.

98

97. The method of claim 91, wherein said compound is administered ocularly.

99

98. The method of claim 91, wherein said compound is administered transdermally.

100

99. The method of claim 91, wherein said compound is administered rectally.

101

100. The method of claim 91, wherein said compound is administered vaginally.

102

101. The method of claim 91, wherein said compound is administered topically.

103

102. The method of claim 91, wherein said compound is administered intramuscularly.

104

103. The method of claim 91, wherein said compound is administered subcutaneously.

105

104. The method of claim 91, wherein said compound is administered buccally.

106

105. The method of claim 91, wherein said compound is administered nasally.